

# Biodiesel can cut greenhouse gas emissions

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Researchers in Spain have discovered that greenhouse gas emissions can be reduced through the use of biodiesel. The group from Universidad Politécnica de Madrid (UPM) in Spain investigated the benefits of using biodiesel by analyzing and quantifying primary and fossil energy consumption on urban buses, as well as by analyzing greenhouse gas emissions. The findings, said the researchers, could help decision makers introduce policies on environmental matters related to road transport.

The UPM's University Institute for Automobile Research (INSIA) researchers, who applied a life-cycle analysis for this study, found that besides fuelling [greenhouse gas emissions](#), the road transport industry makes a huge impact on the environment because its growth has triggered the depletion of [fossil energy](#) resources, including natural and

petrol gases, in recent years.

It is important that alternative sources of fuel are identified to mitigate this growing problem. Experts are currently investigating alternative novel technologies for the post-treatment of exhaust gases. Can biofuels help? Some believe they can help put this problem to rest.

Biodiesel, for instance, is a renewable resource-generated fuel and includes animal fat and vegetable oil. This latest study paid particular attention to two areas: selective catalytic reduction with urea (SCR+urea) and the recirculation of gas exhaust gas with particulate filter (EGR+DPF).

In their life-cycle analysis, the researchers focused on buses belonging to the Madrid-based group Municipal Transport Company, with each bus equipped with post-treatment of exhaust gases technology. Three types of fuel were combined with the gases: diesel, B20 (20% biodiesel and 80% diesel) and B100 (100% biodiesel).

Their data showed that the use of this type of fuel cuts greenhouse [gas emissions](#) but boosts primary energy consumption. However, they pointed out that just a small percentage of this energy corresponds to fossil energy because biodiesel is generated from non-fossil resources like animal fats.

The team also discovered a boost in nitrogen oxides emissions and a drop in particles. According to them, their tendency is to expand as the mixture increases as well.

The researchers said overall fossil energy consumed by the use of biodiesel is the result of crop processes and transesterification. So crop processes need alternatives in order to cut the consumption of fertilisers. What experts need to do is generate a solid amount of fossil energy.

Transesterification, meanwhile, needs to introduce cogeneration systems using renewable energy sources in transesterification plants in order to boost energy efficiency.

Not only can these findings be used to help introduce government policies in terms of environmental issues related to intercity [road transport](#) in [Spain](#), but they can provide extracted information from an extensive review of relevant bibliography and from databases that experts call GEMIS or GaBi 4. The GaBi 4 community has upgraded energy balances, mass and emissions of key processes investigated in this study.

**More information:** Garcia-Sánchez, J.A., et al. 'Life cycle analysis of Euro IV urban buses', *DYNA*, 2012, 87(1), pp. 45-57.

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